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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------------------|------------------|
| 10/037,928 | 01/04/2002 | Alvin Lee | 13530US01 | 7600 |
| 7590 | 03/25/2004 | | | |
| Robert W. Fieseler McAndrews, Held & Malloy, Ltd. 34th Floor 500 West Madison Street Chicago, IL 60661 | | | EXAMINER CHANERY, CAROL DIANE | |
| | | | ART UNIT 1745 | PAPER NUMBER |
| DATE MAILED: 03/25/2004 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/037,928 | LEE ET AL. | |
| | Examiner | Art Unit | |
| | Carol Chaney | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 April 2002.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 03 April 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 26 September 2002.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "separator" in claims 1-27 is used by the claims to mean "a fluid distribution device attached to the edge of an MEA device", while the accepted meaning is

Conductive plate in a fuel cell stack that acts as an anode for one cell and a cathode for the adjacent cell. The plate may be made of metal or a conductive polymer (which may be a carbon-filled composite). The plate usually incorporates flow channels for the fluid feeds and may also contain conduits for heat transfer.

From http://www.nfcrc.uci.edu/fcresources/FCexplained/FC_Comp_Stack.htm

The term is indefinite because the specification does not clearly redefine the term. In particular it is unclear if the thermoplastic sheets disclosed by the applicant are intended to be electrically non-conductive, or if the sheets are intended to be a filled thermoplastic sheet which is electrically conductive.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-8, 10, 11, 13, and 19-23, and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Washington et al., US Patent 5,514,487.

Washington et al. disclose fuel cell stacks having edge manifold assemblies (120) securing the edges of fuel cells in a stack. (See Fig. 3, reference numbers 108, 110, 112). The edge manifold assemblies disclosed by Washington et al. are considered equivalent to the “separators” of the instant invention, since in both cases, the components are located at the edges of the fuel cell stacks and serve to direct fluids into and through the fuel cells. Furthermore, a comparison of Washington et al. Figure 5 and applicants’ Figure 3, show the equivalence of the edge manifold assembly of Washington (120) and the separator (50, 52) of the instant invention.

Washington discloses a planar MEAs (110) having cathode plates (108) and anode plates (112). The cathode and anode plates are considered flow field plates.

(note Figure 9, which illustrates the relation of fuel flow channels (113) with the anode plated (112) and the edge manifold/separator (120). The edge manifold plates are attached are attached to the cathode plates preferably with adhesive. (column 7, lines 61-63.) Thus, the edge manifold plates include a sealing surface. As shown in Figure 5, the edge manifold plate includes ports for coolant (134) fuel (132) and oxidant (134). The edge manifold plates also include fluid distribution features (144, 174) which connect the edge manifold to the flow field plates of the fuel cell stack. As may be seen in Figure 4, the fluid distribution features include channels (142, 144, 146). The spacings between the channels are considered lands. with regards to claim 8, the edge manifold plates are formed from moldable, electrically insulating material, including thermoplastic materials. (Column 4, lines 14-21.) With regards to claims 10 and 11, Figure 5 illustrates the fluid distribution features are “formed in” and “applied to” edge manifold 120. with regards to claim 13, the edge manifolds disclosed by Washington are used in fuel cell as shown in Figure 1. With regards to claims 19-21, Figure 5 of the Washington patent illustrates the limitations of bonding, rectangular MEAs and two edge manifold (separators) attached to a MEA recited in these claims. With regards to claims 22-24, Washington disclosed membrane electrode assemblies (110) containing a solid polymer ion exchange membrane. (Column 5, lines 15-17.) With regards to claim 23, the cathode and anode plates disclosed by Washington are corrugated, as shown in Figure 5 of the Washington et al. patent. With regards to claims 25-27, the methods of operation recited are considered to be encompassed by the Washington disclosure of a fuel cell stack.

Claims 1-8, 10-16, 18-23, and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Marchetti US 6,284,401 B1.

Marchetti et al. disclose a "plate and gasket assembly" for an ionomer membrane fuel cell. (column 2, lines 20-44). The assembly includes a gasket which is considered equivalent to the "separator" recited by the applicants. A gasket disclosed by Marchetti includes two rigid plates (11, 21) of polycarbonate sandwiching a thin graphite late. The gasket includes resilient silicone sealing material on the surfaces of the plates 11 and 21. (Column 3, lines 61-64.) Plates 11 and 21 thus have sealing surfaces. The gaskets include manifolds (12, 13, 14, 15) which have "port channels" (16, 17, 18, 19) and (26, 27, 28, 29) impressed into legs of the gaskets. (Figs. 2 and 3 and column 3, lines 47-51.) The port channels and silicon gasketing form the fluid distribution features recited by the applicants. Thus the fluid distribution feature disclosed by Marchetti et al. comprise silcone, and are applied to the thermoplastic resin. The gaskets disclosed by Marchetti et al. are sealed to the MEA and are sealed at the periphery of the MEA. (See column 4, lines 48-54.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetti et al.

As discussed above, Marchetti et al disclose applicants' invention essentially as claimed, with the exception that Marchetti et al. do not disclose using polyimide as a gasketing (separator) material. However, since no unexpected or critical results are shown for the use of polyimide, polycarbonate and polyimide would be recognized by one of ordinary skill in the art as functionally equivalent to polyimide, and applicants' invention would have been obvious to one of ordinary skill in the art based upon the disclosure of Marchetti et al.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Washington et al.

As discussed above, Washington et al. disclose applicants' invention essentially as claimed, with the exception that Washington does not explicitly disclose metallic flow field plates. However, it is clear from the fuel cell stack shown in Washington Figure 3 that the cathode and anode plates must be electrically conductive for an electrical series connection to be formed within the fuel cell stack. Metal would be an obvious choice by one of ordinary skill in the fuel cell art for an electrically conductive material.

Allowable Subject Matter

Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Encapsulation of a separator/manifold with thermoplastic sheeting is not suggested by the prior art. Such a structure would not be obvious to one of ordinary skill in the art because of additional material requirements the structure would entail.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carol Chaney
Primary Examiner
Art Unit 1745
